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Stottlemyer

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(54) **OPTICAL HYDROPHONE AND ARRAY USING BUBBLE RESONANCE FOR DETECTING ACOUSTIC SIGNALS**

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(57) **ABSTRACT**

An optical hydrophone described herein includes a housing defining a chamber. The housing is acoustically transparent to acoustic waves at a frequency of interest. An optically transparent material fills the chamber and has air-filled voids defined therein that resonate within the material when an incoming acoustic wave impinges on the material. Light introduced into the material and passed therethrough is affected by the air-filled voids resonating within the material. Light is transmitted to and from the material by optical fibers which are coupled to the material on either side thereof. A plurality of these optical hydrophones can be configured in a linear array through which light is passed. Such linear arrays can be used to measure incoming acoustic signals.

15 Claims, 1 Drawing Sheet